

IN THE CLAIMS

Please amend the claims as follows:

Claim 1 (Currently Amended): A plasma display device, comprising:

a plasma display panel comprising a discharge cell including a first electrode and a second electrode; and

a driving unit for driving said discharge cell by giving a potential difference between said first electrode and said second electrode,

wherein said driving unit comprises a pulse generation unit capable of generating a an operational voltage pulse derived from a predetermined pulse waveform, said predetermined pulse waveform changing which continuously changes from a first voltage to a second final voltage,

said driving unit controls said pulse generation unit to start outputting said operational voltage pulse as a voltage including said second final voltage to be applied to said first electrode at said first voltage and then to stop the continuous change of said operational voltage pulse at the point of time when said operational voltage pulse reaches a third voltage, the third voltage being between said first voltage and said second voltage, and

a waveform of said operational voltage pulse is the same as the predetermined pulse waveform between said first voltage and said third voltage.

~~the third voltage is applied to the first electrode at a timing before the second final voltage was to be applied to the first electrode.~~

Claim 2 (Currently Amended): The plasma display device according to claim 1, wherein

Application Serial No.: 09/782,292
Reply to Office Action dated September 23, 2003

 said third voltage is set on the side of said second voltage relative to a firing voltage,
 and

 said operational voltage pulse reaches said third voltage after a time longer than a
 discharge delay time passes from the point of time when said operational voltage pulse exceeds
 said firing voltage.

Claim 3 (Currently Amended): The plasma display device according to claim 1,
wherein

 said operational voltage pulse includes at least one of a CR voltage pulse, a ramp
 voltage pulse and an LC resonant voltage pulse.

Claim 4 (Original): The plasma display device according to claim 3, wherein
 said pulse generation unit is capable of generating a rectangular voltage pulse, and
 said driving unit controls said pulse generation unit to output a voltage pulse in which
 one of said CR voltage pulse, said ramp voltage pulse and said LC resonant voltage pulse is
 superimposed on said rectangular voltage pulse, as a voltage to be applied between said first
 electrode and said second electrode.

Claim 5 (Currently Amended): The plasma display device according to claim 1,
wherein

 when one field for image display is divided into a plurality of subfields each including
 an addressing period and a sustain period set after said addressing period, whether said
 discharge cell should be illuminated or not in said sustain period is determined in said

Application Serial No.: 09/782,292
Reply to Office Action dated September 23, 2003

addressing period and said discharge cell is illuminated in said sustain period if it is determined in said addressing period that said discharge cell should be illuminated,

 said driving unit starts and stops applying said operational voltage pulse in a period other than said addressing period and said sustain period in at least one of said subfields in said one field.

Claim 6 (Currently Amended): The plasma display device according to claim 5,
wherein

 said driving unit performs, with said operational voltage pulse, at least one of an operation for generating a discharge in said discharge cell regardless of a display history and an operation for generating a discharge in said discharge cell only when said discharge cell is illuminated in the immediately preceding sustain period.

Claim 7 (Currently Amended): The plasma display device according to claim 5,
wherein

 said driving unit starts outputting said operational voltage pulse as a voltage to be applied to said first electrode before said addressing period, and
 said third voltage of said operational voltage pulse is set to a value between a ground potential and an address voltage applied to said first electrode in said addressing period in determining that said discharge cell should be illuminated in said sustain period.

Claim 8 (Previously Presented): A plasma display device, comprising:

Application Serial No.: 09/782,292
Reply to Office Action dated September 23, 2003

a plasma display panel comprising a discharge cell including a first electrode and a second electrode; and

a driving unit for driving said discharge cell by giving a potential difference between said first electrode and said second electrode,

wherein one field for image display is divided into a plurality of subfields each including an addressing period and a sustain period set after said addressing period, an address voltage is applied to said first electrode and whether said discharge cell should be illuminated or not in said sustain period is determined in said addressing period, and said discharge cell is illuminated in said sustain period when it is determined in said addressing period that said discharge cell should be illuminated,

and wherein said driving unit performs the steps of:

(a) generating a first voltage pulse having the same polarity as said address voltage has, for generating a discharge in said discharge cell to generate wall charges, and outputting said first voltage pulse as a voltage to be applied to said first electrode; and

(b) generating a second voltage pulse having the same polarity as said first voltage pulse has, for generating a discharge in said discharge cell to control the state of said wall charges, and outputting said second voltage pulse as a voltage to be applied to said first electrode,

both said steps (a) and (b) are performed before said addressing period and said step (b) is performed after said step (a), and

said first voltage pulse and said second voltage pulse have waveforms of which absolute values continuously increase toward a predetermined polarity.

Claim 9 (Original): The plasma display device according to claim 8, wherein
said driving unit further performs the step of:

(c) generating a third voltage pulse having a polarity reverse to that of said first voltage
pulse and outputting said third voltage pulse as a voltage to be applied to said first electrode,
said step (c) is performed between said step (a) and said step (b), and
said third voltage pulse has a waveform of which absolute value continuously increases
toward a predetermined polarity.

Claim 10 (Original): The plasma display device according to claim 8, wherein
said driving unit further performs the step of:

(d) reducing said wall charges in said discharge cell, and
said step (d) is performed before said step (a).

Claim 11 (Original): The plasma display device according to claim 10, wherein
said driving unit sequentially performs, in said step (d), the steps of:
(d-1) generating a fourth voltage pulse for generating a discharge in said discharge cell
and outputting said fourth voltage pulse as a voltage to be applied between said first electrode
and said second electrode; and

(d-2) generating a fifth voltage pulse for generating a discharge in said discharge cell
and outputting said fifth voltage pulse as a voltage to be applied between said first electrode
and said second electrode,

said fourth voltage pulse is a voltage pulse which is capable of generating a discharge at
the rise and the fall of said fourth voltage pulse, and

said fifth voltage pulse has a waveform of which absolute value continuously increases toward a predetermined polarity.

 Claim 12 (Currently Amended): A plasma display device, comprising:

 a plasma display panel comprising a discharge cell including a first electrode and a second electrode; and

 a driving unit for driving said discharge cell by giving a potential difference between said first electrode and said second electrode,

 wherein said driving unit generates a discharge in said discharge cell during an operation for defining whether said discharge cell is illuminated for display or not, regardless of whether said discharge cell is illuminated for display or not,

 said driving unit comprises a pulse generation unit capable of generating a an operational voltage pulse derived from a predetermined pulse waveform, said predetermined pulse waveform changing which continuously changes from a first voltage to a second final voltage,

 said driving unit controls said pulse generation unit to start outputting said operational voltage pulse as a voltage including said second final voltage to be applied to said first electrode at said first voltage, then to stop the change of said operational voltage pulse at the point of time when said operational voltage pulse reaches a third voltage, the third voltage being between said first voltage and said second voltage and thereafter to perform said operation for defining whether said discharge cell is illuminated for display or not, and

a waveform of said operational voltage pulse is the same as the predetermined pulse waveform between said first voltage and said third voltage.

Application Serial No.: 09/782,292
Reply to Office Action dated September 23, 2003

~~the third voltage is applied to the first electrode at a timing before the second final voltage was to be applied to the first electrode.~~

Claim 13 (Original): The plasma display device according to claim 12, wherein
said plasma display panel comprises a plurality of said discharge cells, and
said discharge includes a first discharge and a second discharge weaker than said first
discharge,

 said driving unit performs the operations,
 as said operation for defining whether said discharge cell is illuminated for display or
not, of:

 sequentially applying an address pulse to said first electrode of each of said plurality of
discharge cells to sequentially select said plurality of discharge cells,
 generating said first discharge in a selected one of said plurality of discharge cells when
a data pulse is applied to said second electrode of said selected discharge cell, and
 generating said second discharge in said selected discharge cell when said data pulse is
not applied to said second electrode of said selected discharge cell.

Claim 14 (Canceled).

Claim 15 (New): The plasma display device according to claim 1, wherein
said operational voltage pulse have a pulse width which varies as a function of an
amplitude of said third voltage.

Application Serial No.: 09/782,292
Reply to Office Action dated September 23, 2003

Claim 16 (New): The plasma display device according to claim 1, wherein a first constant voltage is applied to said second electrode during the change of said operational voltage pulse.

Claim 17 (New): The plasma display device according to claim 16, wherein said discharge cell further comprises a third electrode facing said first and second electrode, and a second constant voltage is applied to said third electrode during the continuous change of said operational voltage pulse.

Claim 18 (New): The plasma display device according to claim 1, wherein said operational voltage pulse continuously changes at a varying rate of change.

Claim 19 (New): The plasma display device according to claim 12, wherein said operational voltage pulse have a pulse width which varies as a function of an amplitude of said third voltage.

Claim 20 (New): The plasma display device according to claim 12, wherein, a first constant voltage is applied to said second electrode during the continuous change of said operational voltage pulse.

Claim 21 (New): The plasma display device according to claim 20, wherein

Application Serial No.: 09/782,292
Reply to Office Action dated September 23, 2003

 said discharge cell further comprises a third electrode facing said first and second electrode, and

 another constant voltage is constantly applied to said third electrode during the continuous change of said operational voltage pulse.

Claim 22 (New): The plasma display device according to claim 12, wherein
 said operational voltage pulse continuously changes at a varying rate of change.